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EFFICACY AND COST OF CYCLONE SEEDERS, MOTORCYCLE DISPENSERS, AND HAND BAITING FOR CONTROLLING BLACK-TAILED PRAIRIE DOGS

by

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ABSTRACT

Field evaluations were conducted in Custer County, Montana, during August 1979 to compare three methods of applying bait for controlling black-tailed prairie dogs. Strychnine bait applied by mechanical dispensers mounted on three-wheeled, all-terrain vehicles (ATV) reduced prairie dog activity by 88 percent at a cost of $0.62 per acre. Cost for hand baiting was $0.91 per acre resulting in a 74 percent reduction in prairie dog activity. Broadcast and strip applications with the cyclone seeder were the fastest methods but required a cost of $6.77 and $2.77 per acre respectively, for a 78 percent reduction in activity. The cycle-mounted dispenser was the most efficient and cost effective application method tested.

MONTANA DEPARTMENT OF LIVESTOCK
VERTEBRATE PEST CONTROL BUREAU
BRANDS-ENFORCEMENT DIVISION
HELENA, MONTANA 59601

1979

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INTRODUCTION

Recent increases in populations of black-tailed prairie dogs have stimulated interest in reducing the subsequent consumption and destruction of rangeland vegetation by this species. Ranchers report prairie dog activity reduces forage available for livestock.

Historically, poison grain has been the most widely used means of reducing prairie dog numbers when control operations were deemed necessary. Presently in Montana, prairie dog control operations are conducted on private or state lands by private landowners or limited county rodent control programs. Large acreages require treatment by limited numbers of personnel with limited funding.

Application by hand has been the only method of dispensing bait. However, this practice is tedious and expensive in terms of required manhours. More efficient alternative methods of bait application are needed.

Graham (1978) revealed the advantages of using the cyclone seeder to reduce numbers of Richardson ground squirrels. Bait dispensers mounted on motorcycles have also been used to control prairie dogs in South Dakota (Sandall 1978). Field evaluations were done to determine if these application methods would be useful for controlling prairie dogs in Montana.

OBJECTIVES

Field evaluations were conducted in August 1979 in Custer County, Montana, to determine the efficacy and cost of the cyclone seeder

and motorcycle-mounted bait dispensers as alternatives to hand baiting for reducing prairie dog infestations.

STUDY AREA

Five study sites were selected 30 miles south of Miles City, Montana. The sites were ten acres in size, each similar in vegetation type, numbers of prairie dogs, terrain, and physical aspects. The sites were located on grass/sagebrush rangeland.

METHODS AND MATERIALS

Three separate study sites were baited by the three different methods of application. Time, bait required, and efficacy were recorded for each method.

The cyclone seeder was mounted on the front of a pickup. Vehicle speed was maintained at approximately five miles per hour during bait application. Bait was applied at six pounds per swath acre in parallel 20-foot swaths with 20-foot intervals between swaths. Prebait (nontoxic grain) was also broadcast over one entire plot to determine time and grain required when prebaiting (conditioning rodents to consume nontoxic grain prior to toxic bait application) operations are used (Sullins 1977).

A bait dispenser was mounted on a Honda three-wheeled all-terrain vehicle (ATV). The mechanically-operated dispenser metered out one tablespoon (approximately 0.25 ounces) of bait per application. A pickup truck was driven at 25-foot intervals back-and-forth across a plot. The resulting tire marks were used as a guide for

the ATV operator. Each 25-foot interval was systematically baited by driving the ATV near each burrow entrance and operating a trip lever to dispense the bait. The bait was scattered over a two- or three-foot square area.

Applying bait by hand was accomplished by two men walking parallel back-and-forth across a plot, each treating an approximate 20-foot swath. One calibrated dipper of bait (0.22 ounces) was scattered over a two- or three-foot square area near each burrow entrance.

To avoid variations between plots, bait and prebait were applied to a single plot using all three application methods. During this particular test, prebait (whole oats) was broadcast over the entire plot (no alternate strips) using the cyclone seeder and at each burrow entrance with the ATV dispenser. Strychnine bait (Sebasta's 0.44%) was applied by hand.

Prairie dog activity before and after baiting was used as an index to evaluate the effectiveness of each application method. Binoculars were used to count active prairie dogs on each site three days before and three days after bait application. Three visual counts were made from a common vantage point at approximately the same time each day. An average of the nine counts before treatment and nine counts after treatment provided, respectively, the pre- and post-treatment indices. Percent reduction in prairie dog activity on each site was calculated by the formula:

$$\text{percent reduction} = 1 - \frac{\text{post-treatment index}}{\text{pre-treatment index}} \times 100$$

RESULTS AND DISCUSSION

Time Required

The cyclone seeder, applying bait in 20-foot alternate intervals, required only one minute per acre (Tables 1 and 2). One man using this method applied bait 10 times faster than using an ATV (3 minutes per acre). Continuous broadcast baiting (no intervals, 2.5 minutes per acre) was four and two times faster than hand baiting or ATV application, respectively (Table 1).

Bait or Prebait Required

Bait application by ATV required the least amount of bait at 0.5 pounds per acre (Table 1). Hand baiting required 0.6 pounds of bait per acre. Strip and braodcast application with the cyclone seeder required more bait at 3.4 and 8.3 pounds per acre, respectively.

COST

Bait application by ATV was the most economical method tested ($0.62 per acre) in terms of bait and labor expenses (Table 1). Strychnine bait cost at $0.80 per pound and labor cost at $3.00 per hour were assumed for this study. Cost for hand baiting was $0.92 per acre. Use of the cyclone seeder increased to $6.77 and $2.77 per acre for broadcast and strip application, respectively.

These higher costs, due to increased amounts of bait, may become prohibitive when treating large acreages with the cyclone seeder and expensive biat. Prebait application with the cyclone seeder would be less costly but should only be considered for large acreages.

Efficacy

Good reduction in prairie dog activity (88.0 percent) was obtained by applying strychnine bait with the all-terrain vehicle (Table 2). Strip application with the cyclone seeder yielded a 78.0 percent reduction while hand baiting strychnine resulted in a 74.0 percent reduction in activity. These three efficacy results were obtained without prebaiting to reduce variables for a relative comparison of the application methods. Efficacy testing was not conducted for broadcast application with the cyclone seeder because cost and amounts of bait were considered excessive. Further testing with the cyclone seeder is needed to determine more efficient swath widths and application rates.

Miscellaneous Factors

Operating costs for the use of the ATV in baiting prairie dogs were insignificant. Occasional oil change (1 quart) and gasoline (90 miles per gallon) were the only operating expenses needed. Liquid sealant was used in the tires to prevent tire punctures from cactus typically found in prairie dog towns. Long-term maintenance costs on the dispenser and ATV were not evaluated in this study due to small acreages treated and the short testing period. Cost of the dispenser mounted on the ATV used in this study was $140.00.

Gasoline and maintenance expense for a vehicle (pickup or tractor) to operate the cyclone seeder may significantly add to operating cost when baiting large acreages. Cost of the cyclone seeder used in this study was $200.00.

TABLE 1. Comparison of Time and Bait/Prebait Required to Bait a Common 10-Acre Plot by Hand, Cyclone Seeder, and Motorcyle.

Method of Application	Pounds Per Acre of Bait/Prebait	Minutes Per Acre	Bait & Labor Cost Per Acre (4)
Hand Bait (1)	0.6	8.6	\$0.91 (4)
Motorcycle (1)	0.5	4.3	\$0.62 (4)
Cyclone Seeder (2)	8.3	2.5	\$6.77 (4)
Cyclone Seeder (3)	3.4	1.0	\$2.77 (4)

(1) 0.22 ounces of bait deposited near each burrow entrance.

(2) Bait broadcast over entire plot (no intervals).

(3) Bait applied in alternate 20-foot swaths.

(4) Cost of bait materials (\$0.80 per pound) and labor (\$3.00 per hour).

TABLE 2. Percent Reduction, in Prairie Dog Activity, Time, and Bait/Prebait Required for Baiting by Hand, Cyclone Seeder, and Motorcycle.

Site	Application	Pounds Bait Per Acre	Minutes Per Acre	Percent Reduction
A	Control	---	---	---
B	Hand Bait (strychnine)	0.6	10.0	74.0
C	Cyclone Seeder (20-foot strip)	3.4	1.0	78.0
D	Motorcycle (strychnine)	0.5	3.1	88.0

CONCLUSIONS

In terms of time, cost of bait and/or prebait, and efficacy, this study revealed the following concerning the tested application methods:

1. The ATV-mounted dispenser proved to be the most overall efficient and cost effective application method. Multiple cycles working together in an organized unit could possibly increase efficiency further. The best dispenser mounted on the ATV in this study could also be mounted on a two-wheeled motorcycle.

2. Hand baiting should still be used on small acreages or for spot baiting.

3. Although strip application at 20-foot intervals using the cyclone seeder did not yield satisfactory reduction in prairie dog activity, it was more effective than hand baiting. Further testing may be necessary to determine more effective swath widths and application rates.

4. Cyclone seeders could be used to apply prebait on large acreages when cost of prebait materials is minimal and terrain and vegetation height are suitable.

LITERATURE CITED

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